Claims:

1. An electroactively controlled membrane structure, comprising:

a membrane whose position is to be controlled;

a supporting base;

at least one electroactive bending actuator affixed to the supporting base; and

connection means corresponding to each of the at least one electroactive bending actuators for operatively connecting the membrane to each of the at least one electroactive bending actuators;

wherein displacement of the at least one electroactive bending actuator effects displacement of the membrane.

2. The structure of claim 1, wherein the at least one electroactive bending actuator is a polymer-polymer bilayer actuator.

3. The structure of claim 2, wherein the polymer-polymer bilayer actuator comprises at least one layer of an electrostrictive material.

4. The structure of claim 1, wherein the at least one electroactive bending actuator comprises at least one layer of an electrostrictive material.

5. The structure of claim 1, wherein the at least one electroactive bending actuator is fixed to the supporting base by means selected from the group consisting of mechanical and chemical.

6. The structure of claim 1, wherein the at least one electroactive bending actuator is fixed to the supporting base by a chemical adhesive.

7. The structure of claim 1, comprising three electroactive bending actuators affixed to the supporting base, wherein the connection means operatively connects the three electroactive bending actuators to the membrane, thereby providing three points of control to the membrane.

8. The structure of claim 1, wherein each connection means comprises:

a guiding wheel assembly and a track, wherein displacement of the actuator effects translation of the wheel assembly along the track, thereby imparting movement to the membrane.

9. The structure of claim 1, wherein each connection means comprises:

a guiding track affixed to the membrane;

a guiding wheel assembly, the guiding wheel assembly further comprising an axle, affixed to the electroactive bending actuator, and four guiding wheels which maintain movement of the axle along the guiding track;

whereby bending of the actuator effects displacement of the membrane.

10. The structure of claim 9, wherein the guiding track is affixed to the membrane by means selected from the group consisting of chemical and mechanical.

11. The structure of claim 9, wherein the guiding wheels are position a sufficient distance form the guiding track to allow free movement of the axle along the guiding track.

12. The structure of claim 9, wherein the guiding wheel assembly is made of a material selected from the group consisting of plastic and metal.

13. The structure of claim 9, wherein the guiding track is made of a material selected from the group consisting of plastic and metal.

14. The structure of claim 1, wherein the bending actuator comprises at least one layer of an electrostrictive material having a nonuniform thickness.